

CLAIMS

1. A system for determining in vivo the presence and/or concentration of a biological and/or chemical substance in a body lumen comprising:

a solid support, the support being inserted into a body lumen and having immobilized thereon at least one reactant capable of reacting with the substance resulting in an optical change; and

a detecting unit, in communication with the support, capable of detecting a reaction resulting in an optical change between the reactant and the substance.

2. A system according to claim 1 wherein the support is attached to or is an integral part of a stent, needle or endoscope.

3. A system according to claim 1 wherein the support is attached to or is an integral part of a swallowable capsule.

4. A system according to claim 1 wherein the support is a glass support.

5. A system according to claim 1 wherein the support is a plastic support.

6. A system according to claim 5 wherein the plastic is isoplast.

7. A system according to claim 1 wherein the reactant is immobilized onto the support via a bridging group.

8. A system according to claim 1 wherein the reactant is a chemical compound.

9. A system according to claim 1 wherein the reactant is a biological compound.

10. A system according to claim 1 wherein the reactant is an enzyme.

11. A system according to claim 1 wherein the reactant is an antibody.

12. A system according to claim 1 wherein the reactant is polyacrylic acid.

13. A system according to claim 1 wherein the reactant is polymethylmetacrylate having thrombin linked thereon.

14. A system according to claim 1 wherein the detecting unit is capable of imaging a reaction between the reactant and the substance.

15. A system according to claim 1 further comprising at least one illuminating

element for illuminating the support.

16. A system according to claim 15 wherein the support is transparent to illumination emitted from the illuminating element.

17. A system according to claim 16 wherein the reactant is transparent to the illumination emitted from the illuminating element.

18. A system according to claim 1 wherein the detecting unit detects optical density.

19. A system according to claim 1 wherein the detecting unit detects color changes.

20. A system according to claim 1 further comprising a monitoring unit in communication with the support, said monitoring unit capable of locating the support in the body lumen.

21. A system according to claim 20 further comprising a transmitting unit in communication with the support.

22. A system according to claim 21 wherein the monitoring unit comprises a reception system operable with the transmitting unit, said reception system capable of receiving transmitted output from said transmitting unit thereby locating the support along a pre prepared map of the lumen.

23. A method for determining in vivo the presence and/or concentration of a biological and/or chemical substance in a body lumen comprising the steps of:

inserting into a body lumen a solid support, said support having immobilized thereon at least one reactant capable of reacting with the substance resulting in an optical change and said support being in communication with a detecting unit that is capable of detecting a reaction resulting in an optical change between the reactant and the substance; and

b) receiving information from the detecting unit.

24. A method according to claim 23 wherein the support is attached to or is an integral part of a stent, needle or endoscope.

25. A method according to claim 23 wherein the support is attached to or is an integral part of a swallowable capsule.

26. A method according to claim 23 wherein the support is a glass support.

27. A method according to claim 23 wherein the support is a plastic support.

5 28. A method according to claim 27 wherein the plastic is isoplast.

29. A method according to claim 23 wherein the reactant is immobilized onto the support via a bridging group.

30. A method according to claim 23 wherein the reactant is a chemical compound.

10 31. A method according to claim 23 wherein the reactant is a biological compound.

32. A method according to claim 23 wherein the reactant is an enzyme.

33. A method according to claim 23 wherein the reactant is an antibody.

34. A method according to claim 23 wherein the reactant is poly acrylic acid.

15 35. A method according to claim 23 wherein the reactant is polymethylmetacrylate having thrombin linked thereon.

36. A method according to claim 23 wherein the detecting unit is capable of imaging a reaction between the reactant and the substance.

20 37. A method according to claim 23 further comprising the step of utilizing illumination to illuminate the support.

38. A method according to claim 37 wherein the support is transparent to the illumination.

39. A method according to claim 38 wherein the reactant is transparent to the illumination.

25 40. A method according to claim 23 wherein the detecting unit detects optical density.

41. A method according to claim 23 wherein the detecting unit detects color changes.

42. A method according to claim 23 further comprising the step of locating the

support in the body lumen.

43. A method according to claim 42 wherein locating the support in the body lumen is done by a monitoring unit that is in communication with the support.

5 44. A method according to claim 43 wherein the monitoring unit comprises a reception system operable with a transmitting unit, said transmitting unit being in communication with the support and said reception system capable of receiving transmitted output from the transmitting unit thereby locating the support along a pre prepared map of the lumen.

45. A swallowable capsule comprising the system according to claim 1.

10 46. A swallowable capsule comprising the system according to claim 22.

47. A method according to claim 23 for the detection of substances in the gastrointestinal tract.

48. A method according to claim 47 for the detection of blood or blood components in the gastrointestinal tract.

15 49. A diagnostic device for the detection of blood or blood components in a body lumen comprising

a plastic support, the support being inserted into the body lumen and having immobilized thereon at least one reactant capable of reacting with the blood or blood components resulting in an optical change;
and

20 a detecting unit, in communication with the support, capable of detecting a reaction resulting in an optical change between the reactant and the blood or blood components.